SEVENOAKS SCHOOL

YEAR 7 (11+) ENTRANCE EXAMINATION
January 2016
for entry in September 2016

MATHEMATICS

Name: _____

School: _____.

Time allowed: 1 hour

Equipment needed: Pen, pencil, eraser, ruler.

Information for candidates:

1. Calculators are NOT allowed.
2. Write your name and school on this sheet.
3. Write your answers on the question paper in the space provided.
4. There are 27 questions in this paper, try to answer all of them, but don't worry if you don't complete the paper. If you get stuck, just go on to the next question and if you have time at the end come back to the one(s) you left.
5. There are 60 marks in total available for this paper. Marks for each question are shown in square brackets [ ] after the question.
6. Show all your working. You may be awarded marks for correct working even if your final answer is incorrect, and a correct answer unsupported by correct working may not receive full marks.

1. 39 members of Alwick Youth Club went on an outing to a leisure centre. They went in minibuses which could seat up to 15 members.

   a) How many minibuses were needed?

   _____ [1 mark]

   b) How many spare seats were there?

   _____ [1 mark]

   The transport costs were £90 altogether. They also had to pay £150 for the group to use the leisure centre. Helen collected £6.50 from each passenger to pay for this.

   c) How much was left over?

   _____ [2 marks]

2. 17 tickets cost £21.25. They all cost the same.

   a) Find the cost of one ticket.

   _____ [2 marks]

   b) Find the cost of seven tickets.

   _____ [1 mark]

3. The cost of a calculator is £6.79.

   a) Work out the cost of 28 of these calculators.

   _____ [2 marks]

   b) A college wants to buy 570 calculators. They are sold in boxes of 50. Work out the number of boxes the college should buy.

   _____ [1 mark]

4. Michelle has the same number of 10p and 50p coins. The total value of the coins is £9. How many of each coin does she have?

_____ [2 marks]

5. Arrange the following in ascending order: $\frac{7}{10}$, $\frac{13}{20}$, $\frac{2}{3}$

_____ [1 mark]

6. Mr Shah had $15\frac{1}{2}$ m of wire. He cut off a piece of wire $2\frac{3}{4}$ m long. How much wire did he have left?

_____ [2 marks]

7. Dan has to walk $1\frac{3}{4}$ km to school. How far has he walked when he is halfway?

_____ [1 mark]

8. In a class of 40 pupils, 14 failed the physical fitness test. What percentage of the class failed the test?

_____ [1 mark]

9. A used-car dealer sells a car at 120% of its cost. If a car costs £25000, how much will he sell the car for?

_____ [1 mark]

10. A drink contains lime, orange and apple juices in the ratio 2:7:6. Find the volume of orange juice contained in 300ml of the drink.

_____ [2 marks]

11. Find three prime numbers that add up to another prime number.

_____ [2 marks]

12. a) Write 3.14 correct to 1 decimal place.

_____ [1 mark]

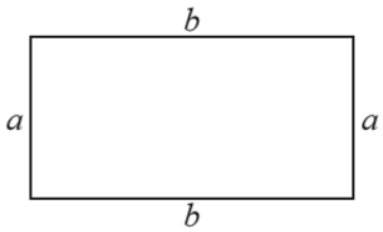
b) Write 0.085 correct to 2 decimal places.

_____ [1 mark]

c) Write 5.97 correct to 1 decimal place.

_____ [1 mark]

13.



a) Find a formula for the perimeter, P, of the shape above.

_____ [1 mark]

b) Use the formula to find the value of P when $a = 5\text{cm},\ b = 10\text{cm}$.

_____ [1 mark]

14. A square has a perimeter of 5.6 m. Calculate the area of the area of the square.

_____ [2 marks]

15. Find the area of the unshaded region in the diagram below.

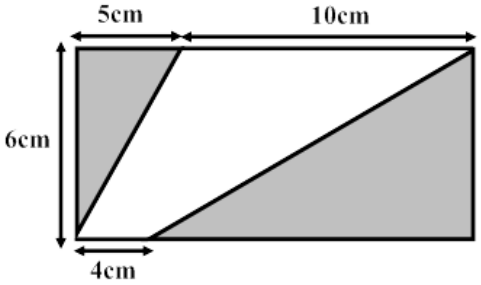


Diagram not drawn to scale

_____ [2 marks]

16. Find the area of the shaded region in the diagram below. Give your answer in terms of π.

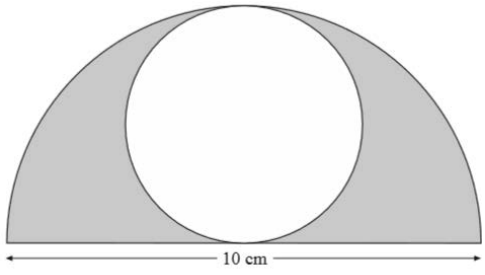
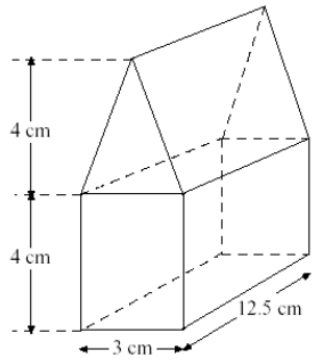


Diagram not drawn to scale

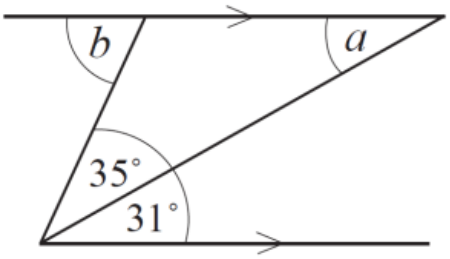
_____ [2 marks]

17. A model house is made by sticking a triangular prism on top of a rectangular block as shown in the diagram. Find the volume of the model house.



_____ [2 marks]

18. Find the size of the angles marked with the letters a and b.



$a =$ _____ [1 mark]

$b =$ _____ [1 mark]

19. Determine the mean, median and mode of the following set of numbers: 16, 9, 11, 13, 11, 15.

mean = _____ [1 mark]

median = _____ [1 mark]

mode = _____ [1 mark]

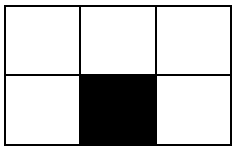
20. The mean of four numbers x, 4, 5, and y is 5 and the range of the numbers is 7.
Find x and y.

_____ [2 marks]

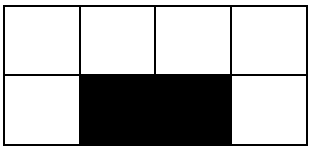
21. Dini thought of a number. She doubled this number and added 10 to give the result 52.
What number did Dini think of?

_____ [2 marks]

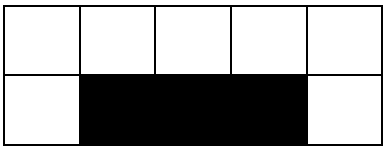
22. In these diagrams, black squares are surrounded on three sides by white squares. Let b represent the number of black squares and w represent the number of white squares.



$b = 1$
$w = 5$



$b = 2$
$w = 6$



$b = 3$
$w = 7$

a) Draw the next diagram (which has 4 black squares).

[1 mark]

b) Write down a rule to link the number of white squares to the number of black squares.

_____ [1 mark]

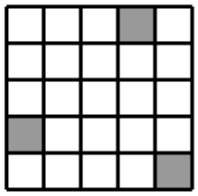
c) How many white squares will the diagram with 10 black squares have?

_____ [1 mark]

23. If ▲ + ▲ = ■ and ■ + ▲ = ● and ♦ = ● + ■ + ▲, how many ▲s are equal to ♦ ?

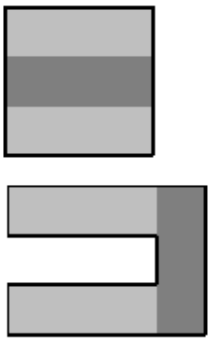
_____ [2 marks]

24. What is the smallest number of additional squares which must be shaded so that this figure has at least one of line symmetry *and* rotational symmetry of order 2?



_____ [2 marks]

25. A square is divided into three congruent rectangles. The middle rectangle is removed and replaced on the side of the original square to form an octagon as shown.



What is the ratio of the perimeter of the square to the perimeter of the octagon?

_____ [3 marks]

26. Two adults and two children wish to cross a river. They make a raft but it will carry only the weight of one adult or two children. What is the minimum number of times the raft must cross the river to get all four people to the other side? (N.B. The raft may not cross the river without at least one person on board.)

_____ [3 marks]

27. In this magic square, which uses all whole numbers from 7 to 15 (including 7 and 15), each of the rows, columns and the two main diagonals have the same total. Which number replaces n in the completed square?

n		
		7
		14

_____ [3 marks]

Total: [60 marks]